Dove Creek

Water level control

Buried inlet pipe with stub-outs for maintenance

Cattails establishing themselves

View of parallel wetland cells

Dove Creek Facility Statistics	
Nearest Town:	**Dove Creek**
County:	**Dolores**
River Basin:	**La Plata River**
Receiving Water Body:	**Dove Creek**
Year Online	**1999**
Population:	**743**
Elevation (feet):	**6844**
Design Flow (mgd):	**0.115**
Average Flow (mgd):	**0.035**
Size (acres):	**1**

Facility Description

The Dove Creek Wastewater Treatment Facility is a minor municipal lagoon system. This facility consists of two aerated lagoons, one settling pond, followed by a surface flow constructed wetland. Disinfection consists of a gas chlorination system followed by a tablet-style dechlorination unit.

Lagoons

The Dove Creek lagoon system consists of 2 aerated cells, followed by a settling pond. The shallow lagoon system was retrofit with a methane fermentation pit covered by a 45-mil polypropylene liner, in cell 1. Lagoon system features are outlined in the table below.

Lagoon Information				
Cell No.:	**Fermentation Pit**	**1**	**2**	**3**
Surface Area (sq. ft.)	**5,878**	**47,000**	**40,000**	**4,500**
Avg. Depth (ft)	**18**	**8**	**8**	**11**
Avg. Volume (Million gallons)	**0.747**	**1.83**	**2.06**	**0.15**
Detention time (days)	**13**	**30**	**34**	**2.2**
Aerator size (hp)	**36**	**10**	**5**	**NA**

Background Information

The Dove Creek system experienced numerous violations for BOD and TSS removal since plant start-up . In October of 1995 the town received a Notice of Violation and Cease and Desist Order, and continued to operate under this notice with significant noncompliance for several years. A study was completed in December 1997 in order to determine remedial alternatives for improved wastewater treatment. The study looked at each option for treatment and cost factors. Options considered included intermittent sand filters, land application of wastewater, utilizing a managed duckweed pond, providing a “pretreatment” anaerobic stabilization zone, increase depths of existing lagoons, and installing constructed wetlands. Dove Creek looked at the Town of Ouray wetlands. Also mentioned is the pilot scale study at Las Animas between 1991 and 1993 to evaluate the effectiveness of constructed wetlands for algae removal.

Energy Analysis

The majority of the energy consumption at this facility is in the operation of the aerators. A typical energy bill per moth is $1,600.

Construction Cost

The approximate construction costs for this system were $363,000.

Wetland Design

Size

The wetland system consists of 4 surface-flow cells and 1 sub-surface flow cell covering approximately 1 acre of ground.

Shape

As shown in the schematic, the wetland cells are generally rectangular, with some curves added in order to fit the site location.

Hydraulics

Design features include: 45-mil polypropylene liners on all cells; distribution boxes to allow bypass of any one cell for maintenance; infinitely-adjustable flow control devices for each wetland cell; recirculation pump and lines that will allow recirculation to the wetlands headworks and/or to the treatment plant headworks.

Treatment Goals

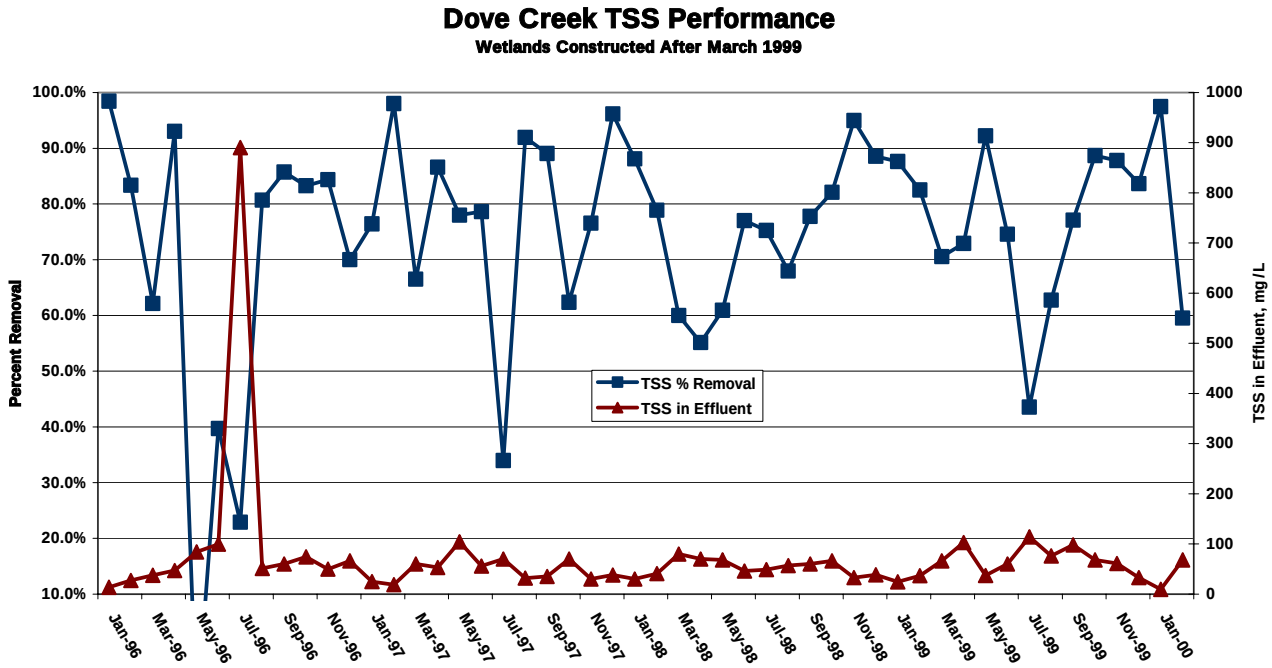
Permitted Discharge Limitations	
Oil and Grease:	**10 mg/l (Daily Max)**
BOD_5:	**30 mg/l (30-day ave)**
BOD_5 Removal:	**85%**
TSS:	**75 mg/l (30-day ave)**
PH, su (min – max)	**6.5 – 9.0 (Daily Max)**
Chlorine Residual:	**0.5 mg/l (Daily Max)**
Fecal Coliform Bacteria:	**2,000 organisms per 100 ml (Daily Max)**

Water Quality Data

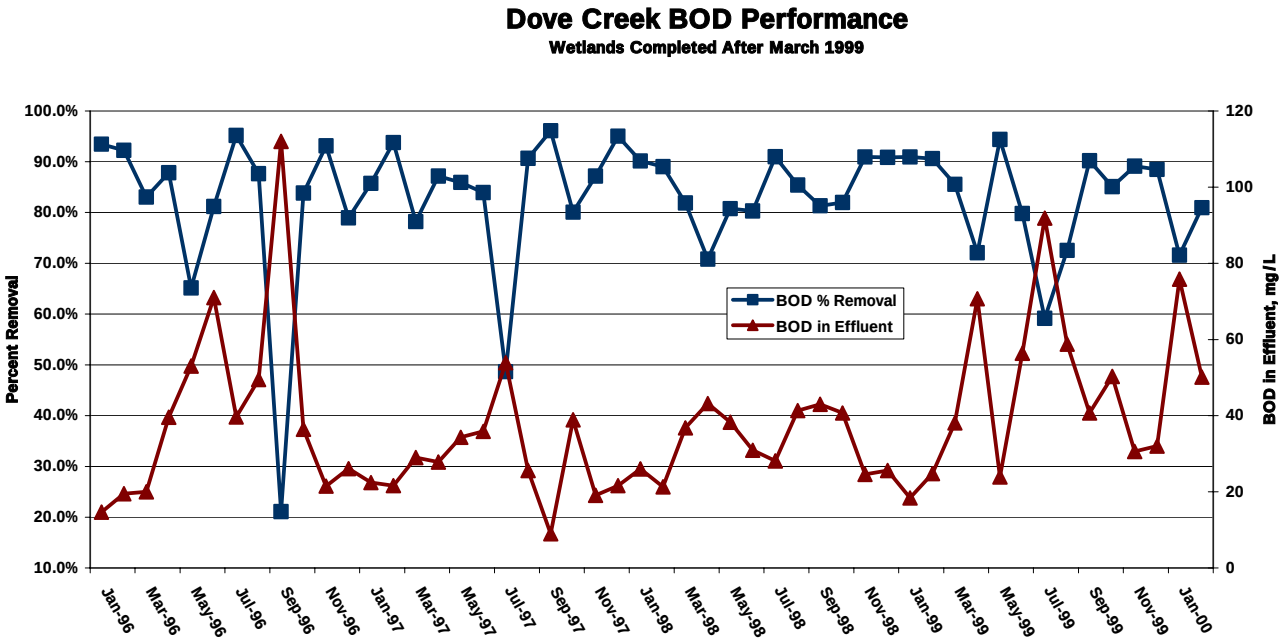
TSS Data

Some general observations can be made by reviewing the plotted 30-day average TSS data. The TSS graph plots the percent removal on the left axis and TSS in mg/l in the effluent on the right axis. The average monthly TSS in the influent, since the wetland implementation, has been 342 mg/l and the average monthly effluent has been 66 mg/l. This meets the permit discharge requirement of 105 mg/l.

BOD Data

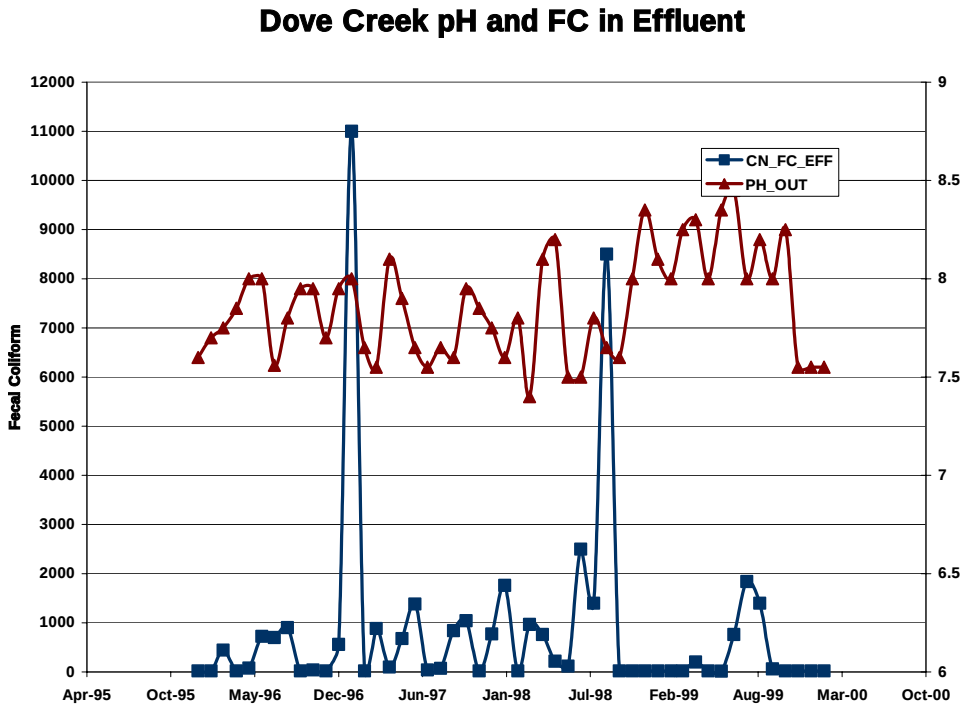


The BOD data is plotted similarly to the TSS data, with mg/l in the effluent on the right axis, and percent removal on the left axis. The average monthly influent amount has been 294 mg/l and the average monthly effluent amount has been 52 mg/l.



pH and Fecal Coliform

Data for these two categories have been plotted on the same graph. Data reflect the quality of the effluent; no influent measurements are taken for these parameters. The pH values plotted are an average of the



minimum and maximum 30-day values that are reported in the monthly reports. Since the wetland implementation, pH values have consistently stayed within the allowable range of 6.5 to 9.

General Ecological Setting

A mixture of piñon pine and juniper dominate forested areas surrounding the Dove Creek wetland. This type of forest rarely forms a closed canopy. The general area is also surrounded by agricultural lands that include non-irrigated cropland, dryland improved pastures, fallow lands, rural development, ranch and farm facilities and shelter belts.

Cell Vegetation

Each of the five cells are about 75 percent vegetation, 15 percent bare soil, and 10 percent open water. The only plant species present is cattail (*Typha latifolia*)

Planting/Seeding

Cells were originally planted in fall 1999 with 9000 cattails from Minnesota at a cost of $0.33 per plant. In summer 2000, 2700 cattails were replanted. Topsoil from the site was used for the plantings.

Weeds

No noxious weeds were noted during the site visit.

Wildlife

Areas adjacent to the wetland were highly disturbed during construction and vegetation has yet to reestablish. The wetland itself has low structural diversity and the cattails are not fully established. Maturation of the vegetation along with the attribute of open water may provide future wildlife habitat of higher value. At present, the general habitat and habitat diversity are low to moderate. Total functional points were 52% of the total possible, and this wetland rated as a category III wetland.

Wetland Biodiversity Functional Assessment

Wetland Biodiversity Functional Assessment.

Function and Value Variables	Functional Points (0.1 to 1)	Possible Points
General Wildlife Habitat	0.5 (mod.)	1
General Fish / Aquatic Habitat	0.0	1
Production Export / Food Chain Support	0.7 (mod.)	1
Habitat Diversity	0.2 (low)	1
Uniqueness	0.2 (low)	1
Total Points	2.6 (52%)	5
Wetland Category (I, II, III, or IV)	III	

Human Use

This site is in a restricted human use area, and has never been used for educational purposes. This wetland has moderate aesthetic value. It has a healthy vegetation cover.

Maintenance Issues

No maintenance issues were noted during the site visit.

Site Summary

This site has good vegetation cover and is functioning as intended. There are no major maintenance or weed problems at the site.